

CLAIMS

I/We claim:

- [c1] 1. An aircraft system, comprising:
a cleat body having a cleat slot, the cleat slot having an open end with a first width and a closed end with a second width; and
a retainer coupled to the cleat body and movable between a first position with the retainer at least restricting access to the cleat slot and a second position with the retainer positioned to allow a flexible recovery line to enter the cleat slot, the retainer having first and second portions positioned to restrict access to the cleat slot when the retainer is in the first position, the first and second portions being spaced apart by a distance sufficient to receive the recovery line.
- [c2] 2. The system of claim 1, further comprising an aircraft having a lifting surface, wherein the cleat body is fixedly attached to the lifting surface and positioned to releasably secure the aircraft to the recovery line when the aircraft intercepts the recovery line.
- [c3] 3. The system of claim 1, further comprising an aircraft having a wing, wherein the cleat body is fixedly attached at least proximate to an outboard edge of the wing and positioned to releasably secure the aircraft to the recovery line when the aircraft intercepts the recovery line.
- [c4] 4. The system of claim 1 wherein the first and second retainer portions are rigidly coupled together to move as a unit.
- [c5] 5. The system of claim 1 wherein the first and second retainer portions pivotally move independent of each other.

- [c6] 6. The system of claim 1, further comprising an aircraft having a longitudinal axis and a lateral axis transverse to the longitudinal axis, the aircraft further having a lifting surface swept back relative to the lateral axis, wherein the cleat body is mounted to the lifting surface and includes a leading edge swept back relative to the lateral axis and positioned to deflect the recovery line away from the aircraft if the recovery line does not enter the cleat slot.
- [c7] 7. The system of claim 1, further comprising an aircraft having a forward swept lifting surface, wherein the cleat body is fixedly attached to the lifting surface and positioned to releasably secure the aircraft to the recovery line when the aircraft intercepts the recovery line.
- [c8] 8. The system of claim 1, further comprising an aircraft having an aft swept lifting surface, wherein the cleat body is fixedly attached to the lifting surface and positioned to releasably secure the aircraft to the recovery line when the aircraft intercepts the recovery line.
- [c9] 9. The system of claim 1, further comprising an aircraft having a generally unswept lifting surface, wherein the cleat body is fixedly attached to the lifting surface and positioned to releasably secure the aircraft to the recovery line when the aircraft intercepts the recovery line.
- [c10] 10. The system of claim 1 wherein the first width of the cleat slot is greater than the second width of the cleat slot.
- [c11] 11. The system of claim 1, further comprising a resilient member positioned to apply force on the retainer moving the retainer from the second position back to the first position.

[c12] 12. An aircraft system, comprising:
a cleat body operatively connected to an unmanned aircraft, the cleat body including a cleat slot having an open end with a first width and a closed end with a second width less than the first width;
a retainer coupled to the cleat body and pivotally movable between a first position with the retainer at least restricting access to the cleat slot and a second position with the retainer positioned to allow a flexible recovery line to enter the cleat slot, the retainer having first and second portions positioned to restrict access to the cleat slot when the retainer is in the first position, the first and second portions being spaced apart by a distance sufficient to receive the recovery line; and
a resilient member coupled to the cleat body and positioned to apply force on the retainer moving the retainer from the second position back to the first position.

[c13] 13. The system of claim 12, further comprising the aircraft, and wherein the aircraft includes a lifting surface with the cleat body fixedly attached to the lifting surface and positioned to releasably secure the aircraft to the recovery line when the aircraft intercepts the recovery line.

[c14] 14. The system of claim 12, further comprising the aircraft, and wherein the aircraft includes a wing with the cleat body fixedly attached at least proximate to an outboard edge of the wing and positioned to releasably secure the aircraft to the recovery line when the aircraft intercepts the recovery line.

[c15] 15. The system of claim 12 wherein the first and second retainer portions are rigidly coupled together to move as a unit.

[c16] 16. The system of claim 12, further comprising an aircraft having a longitudinal axis and a lateral axis transverse to the longitudinal axis, the aircraft

further having a lifting surface swept back relative to the lateral axis, wherein the cleat body is mounted to the lifting surface and includes a leading edge swept back relative to the lateral axis and positioned to deflect the recovery line away from the aircraft if the recovery line does not enter the cleat slot.

[c17] 17. The system of claim 12 wherein the resilient member includes a spring.

[c18] 18. An aircraft system, comprising:
an unmanned aircraft having a fuselage and a lifting surface;
a cleat body fixedly attached to the lifting surface and having a cleat slot,
the cleat slot having an open end with a first width and a closed end
with a second width; and
a retainer coupled to the cleat body and movable between a first position
with the retainer at least restricting access to the cleat slot and a
second position with the retainer positioned to allow a flexible
recovery line to enter the cleat slot, the retainer having first and
second portions positioned to restrict access to the cleat slot when
the retainer is in the first position, the first and second portions being
spaced apart by a distance sufficient to receive the recovery line.

[c19] 19. The system of claim 18 wherein the aircraft includes a longitudinal
axis and a lateral axis transverse to the longitudinal axis with the lifting surface
swept back relative to the lateral axis, and wherein the cleat body includes a
leading edge swept back relative to the lateral axis and positioned to deflect the
recovery line away from the aircraft if the recovery line does not enter the cleat
slot.

[c20] 20. The system of claim 18 wherein the cleat body is fixedly attached at
least proximate to an outboard edge of the lifting surface.

- [c21] 21. The system of claim 18 wherein the first and second retainer portions are rigidly coupled together to move as a unit.
- [c22] 22. The system of claim 18 wherein the first and second retainer portions pivotally move independent of each other.
- [c23] 23. The system of claim 18 wherein the first width of the cleat slot is greater than the second width of the cleat slot.
- [c24] 24. The system of claim 18, further comprising a resilient member positioned to apply force on the retainer moving the retainer from the second position back to the first position.
- [c25] 25. A method for capturing an unmanned aircraft in flight, comprising:
flying an unmanned aircraft having a lifting surface and a line capture device mounted to the lifting surface so as to intercept a flexible recovery line;
receiving the recovery line in a slot of the line capture device; and
releasably securing the recovery line to the line capture device with a retainer by passing the recovery line past at least one of two spaced apart portions of the retainer and moving the at least one portion of retainer relative to the recovery line as the recovery line moves through the slot.
- [c26] 26. The method of claim 25 wherein passing the recovery line past the retainer includes moving the retainer from a first position pivotally out to a second position as the recovery line moves past the first portion of the retainer and moving the retainer pivotally back to the first position, and again moving the retainer from the first position pivotally out to the second position as the recovery line moves past the second portion of the retainer, and then moving the retainer pivotally back to the first position.

[c27] 27. The method of claim 25, further comprising applying tension to the flexible recovery line before intercepting the recovery line with the aircraft.

[c28] 28. The method of claim 25, further comprising retrieving the aircraft from the flexible recovery line after releasably securing the aircraft to the recovery line.

[c29] 29. A method for capturing an unmanned aircraft in flight, comprising:
flying an unmanned aircraft having a lifting surface and a line capture device, the line capture device including a cleat body with a cleat slot, the cleat body being fixedly attached to the lifting surface so as to intercept a flexible recovery line;
receiving the recovery line in the cleat slot;
moving the recovery line into the cleat slot by passing the recovery line past at least one engaging portion of a retainer; and
releasably securing the recovery line in the cleat slot with the retainer.

[c30] 30. The method of claim 29 wherein passing the recovery line includes moving the retainer from a first position pivotally out to a second position as the recovery line moves past a first engaging portion of the retainer and moving the retainer pivotally back to the first position, and again moving the retainer from the first position pivotally out to the second position as the recovery line moves past a second engaging portion of the retainer spaced apart from the first engaging portion, and then moving the retainer pivotally back to the first position.

[c31] 31. The method of claim 29, further comprising applying tension to the flexible recovery line before intercepting the recovery line with the aircraft.

[c32] 32. The method of claim 29, further comprising retrieving the aircraft from the flexible recovery line after releasably securing the recovery line in the slot with the retainer.